

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

Attorney's Docket Number
5725.0622

U.S. Application No.

09/582714

International Application. No. | International Filing Date
CT/FR99/02585 | October 25, 1999

Priority Date Claimed
November 3, 1998

Title of Invention:

EROSOL DEVICE CONTAINING A CONDENSATION POLYMER COMPRISING AT LEAST A POLYURETHANE AND/OR
POLYUREA UNIT

529 Rec'd PCT/PTO 30 JUN 2000

Applicant(s) For DO/EO/US: Arnaud VILBERT

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US)
the following items and other information:

1. ☒ This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☐ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:


11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☐ Other items or information:
 - a. ☐ Verified Small Entity Statement.
 - b. ☐ Copy of Notification of Missing Requirements.

7. [X] The following fees are submitted:	CALCULATIONS
Basic National Fee (37 CFR 1.492(a)(1)-(5)):	
Search Report has been prepared by the EPO or JPO.....	\$840.00
International preliminary examination fee paid to USPTO (37 CFR 1.482).....	\$670.00
No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)).....	\$690.00
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO.....	\$970.00
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4).....	\$ 96.00
ENTER APPROPRIATE BASIC FEE AMOUNT =	\$ 840.00
Surcharge of \$130.00 for furnishing the oath or declaration later than [] 20 [] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	\$
Claims Number Filed Number Extra Rate	
Total Claims 27- 20=	X \$18.00 \$ 126.00
Independent Claims 1- 3=	X \$78.00 \$
Multiple dependent claim(s) (if applicable)	+\$260.00 \$ 260.00
TOTAL OF ABOVE CALCULATIONS =	\$1,226.00
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28)	\$
SUBTOTAL =	\$
Processing fee of \$130.00 for furnishing the English translation later than [] 20 [] 30 months from the earliest claimed priority date (37 CFR 1.492(f)).	\$
TOTAL NATIONAL FEE =	\$1,226.00
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31).	\$40.00 per property + \$
TOTAL FEES ENCLOSED =	\$1,226.00
Amount to be refunded	\$
charged	\$

- a. [X] A check in the amount of \$1,226.00 to cover the above fees is enclosed.
- b. [] Please charge my Deposit Account No. in the amount of \$ to cover the above fees. A duplicate copy of this sheet is enclosed.
- c. [X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 06-0916. A duplicate copy of this sheet is enclosed.

The Commissioner is hereby authorized to charge any other fees due under 37 C.F.R. §1.16 or §1.17 during the pendency of this application to our Deposit Account No. 06-0916.

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Submitted: June 30, 2000

#3
PATENT

Attorney Docket No. 5725.0622

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re National Stage of International)
Application No.: PCT/FR99/02585 of:)
Arnaud VILBERT)
Serial No.: Unassigned) Group Art Unit: Unassigned
PCT Filed: October, 25 1999) Examiner: Unassigned
National Stage Entry: June 30, 2000)

For: AEROSOL DEVICE CONTAINING A CONDENSATION POLYMER
COMPRISING AT LEAST A POLYURETHANE AND/OR POLYUREA UNIT

BOX PCT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

PRELIMINARY AMENDMENT

Prior to the examination of the above-identified application, please amend this
application as follows:

IN THE CLAIMS:

Please cancel claims 1 to 26. Please add new claims 27 to 69.

-- 27. A process for shaping or holding a hairstyle, comprising:

dispensing a hair composition using a dispenser device, said dispenser device comprising

a reservoir containing said hair composition; wherein

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(i) the composition comprises, in a cosmetically acceptable medium, at least one polycondensate (A) comprising at least one block chosen from polyurethane and polyurea blocks and at least one film-forming polymer (B); and

(ii) the at least one polycondensate (A), the at least one film-forming polymer (B), and the device being chosen so as to obtain, on leaving the device, droplets of said hair composition with an average diameter of less than or equal to 80 μm .

28. A process for manufacturing a hairstyling product, the process comprising:

including a hair composition in a dispenser device, said dispenser device comprising a reservoir containing said hair composition; wherein

(i) the composition comprises, in a cosmetically acceptable medium, at least one polycondensate (A) comprising at least one block chosen from polyurethane and polyurea blocks and at least one film-forming polymer (B); and

(ii) the at least one polycondensate(A), the at least one film-forming polymer(B), and the device being chosen so as to obtain, on leaving the device, droplets of said hair composition with an average diameter of less than or equal to 80 μm .

29. A dispenser device comprising a reservoir containing a hair composition, wherein:

(i) the composition comprises, in a cosmetically acceptable medium, at least one polycondensate (A) comprising at least one block chosen from polyurethane and polyurea blocks and at least one film-forming polymer (B); and

(ii) the at least one polycondensate (A), the at least one film-forming polymer(B), and the device being chosen so as to obtain, on leaving the device, droplets of said hair composition with an average diameter of less than or equal to 80 μm .

30. The device according to claim 29, wherein the composition contains an organic solvent.

31. The device according to claim 29, wherein the at least one polycondensate (A) is formed by an arrangement of blocks.

32. The device according to claim 31, wherein said arrangement of blocks is obtained from:

(1) at least one compound which contains at least two active hydrogen atoms per molecule;

(2) at least one substance chosen from at least one diol containing at least one acid radical and the salts of said at least one diol; and

(3) at least one isocyanate chosen from di- and polyisocyanates.

33. The device according to claim 32, wherein the at least one compound (1) is chosen from diols, diamines, polyesterols and polyetherols.

34. The device according to claim 32 wherein said at least one substance (2) is a 2,2-hydroxymethylcarboxylic acid.

35. The device according to claim 32, wherein said at least one isocyanate (3) is chosen from hexamethylene diisocyanate, isophorone diisocyanate, toluylene diisocyanate, diphenylmethane 4,4'-diisocyanate, dicyclohexylmethane 4,4'-diisocyanate, methylenebis(p-phenyl) diisocyanate, methylenebis(4-cyclohexyl isocyanate), isophorone diisocyanate, toluene diisocyanate, 1,5-naphthalene diisocyanate, 4,4'-diphenylmethane diisocyanate, 2,2'-dimethyl-4,4'-diphenylmethane diisocyanate, 1,3-phenylene diisocyanate, 1,4-phenylene diisocyanate, mixtures of 2,4- and 2,6-toluene diisocyanate, 2,2'-dichloro-4,4'-diisocyanatodiphenylmethane, 2,4-dibromo-1,5-diisocyanatonaphthalene, butane 1,4-diisocyanate, 1,6-hexane diisocyanate and 1,4-cyclohexane diisocyanate.

36. The device according to claim 31, wherein the at least one polycondensate (A) is formed from at least one additional compound having a silicone skeleton, chosen from polysiloxanes, polyalkylsiloxanes and polyarylsiloxanes.

37. The device according to claim 36, wherein said additional compound is chosen from polyethylsiloxanes, polymethylsiloxanes and polyphenylsiloxanes.

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38. The device according to claim 36, wherein said additional compound comprises hydrocarbon-based chains grafted onto the silicon atoms.

39. The device according to claim 29, wherein the at least one polycondensate (A) has a repeating base unit corresponding to the formula I' below:



in which:

- X' is chosen from O and NH,
- B is a hydrocarbon-based radical, this radical being substituted or unsubstituted, and
- R is a divalent radical chosen from alkylene radicals of aromatic type, C₁ to C₂₀ aliphatic radicals and C₁ to C₂₀ cycloaliphatic radicals, these radicals being substituted or unsubstituted.

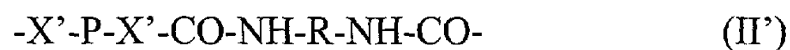
40. The device according to claim 39, wherein B is a divalent C₁ to C₃₀ hydrocarbon-based radical.

41. The device according to claim 39, wherein the radical R is chosen from hexamethylene, 4,4'-biphenylenemethane, 2,4- and 2,6-tolylene, 1,5-naphthylene, p-phenylene, methylene-4,4-bis-cyclohexyl radicals and the divalent radical derived from isophorone.

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42. The device according to claim 29, wherein the at least one polycondensate (A) has a repeating base unit corresponding to formula (II'):



in which:

- P is a polysiloxane segment,
- X' is chosen from O and NH, and
- R is a divalent radical chosen from alkylene radicals of aromatic type, C₁ to C₂₀ aliphatic radicals and C₁ to C₂₀ cycloaliphatic radicals, these radicals being substituted or unsubstituted.

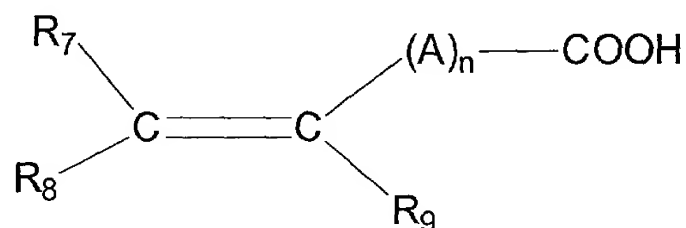
43. The device according to claim 29, wherein the composition comprises, as a relative proportion by weight, from 0.1 to 30% of the at least one polycondensate (A).

44. The device according to claim 29, wherein the composition comprises, as a relative proportion by weight, from 0.1 to 30% of the at least one film-forming polymer (B).

45. The device according to claim 29, wherein the composition comprises an additional organic solvent present in a relative weight concentration of from 0.5 to 80%.

46. The device according to claim 29, wherein the at least one film-forming polymer (B) is chosen from anionic polymers chosen from:

- polymers comprising carboxylic units derived from unsaturated mono- and dicarboxylic acid monomers of formula:



in which n is an integer from 0 to 10, A denotes a methylene group, optionally connected to the carbon atom of the unsaturated group, or to the neighbouring methylene group when n is greater than 1, via a hetero atom such as oxygen or sulphur, R_7 is chosen from a hydrogen atom, a phenyl group, and a benzyl group, R_8 is chosen from a hydrogen atom, lower alkyl groups and a carboxyl group, R_9 is chosen from a hydrogen atom, lower alkyl groups, a $-CH_2-COOH$ group, a phenyl group, and a benzyl group; and

- polymers comprising units derived from sulphonic acid.

47. The device according to claim 46, wherein said units derived from sulphonic acid are chosen from vinylsulphonic, styrenesulphonic and acrylamidoalkylsulphonic units.

48. The device according to claim 46, wherein the anionic film-forming polymers are chosen from:

- acrylic acid copolymers;
- copolymers derived from crotonic acid;
- copolymers derived from (i) maleic, fumaric and itaconic acids and anhydrides of said acids and (ii) vinyl esters, vinyl ethers, vinyl halides, phenylvinyl derivatives, acrylic acid and esters thereof;
- copolymers derived from (i) methacrylic acid and (ii) methyl methacrylate;
- copolymers derived from (i) methacrylic acid and (ii) ethyl acrylate;
- vinyl acetate/crotonic acid copolymers; and
- vinyl acetate/crotonic acid/polyethylene glycol terpolymers.

49. The device according to claim 48, wherein said acrylic acid copolymers are chosen from acrylic acid/ethyl acrylate/N-tert-butylacrylamide terpolymers.

50. The device according to claim 48, wherein said copolymers derived from crotonic acid are chosen from vinyl acetate/vinyl tert-butylbenzoate/crotonic acid terpolymers and crotonic acid/vinyl acetate/vinyl neodecanoate terpolymers.

51. The device according to claim 48, wherein said copolymers derived from (i) maleic, fumaric and itaconic acids and anhydrides of said acids and (ii) vinyl esters, vinyl ethers, vinyl halides, phenylvinyl derivatives and acrylic acid and esters thereof are chosen from methyl vinyl ether/monoesterified maleic anhydride copolymers.

52. The device according to claim 29, wherein the at least one film-forming polymer (B) is chosen from amphoteric polymers chosen from polymers comprising units derived from:

- a) at least one monomer chosen from acrylamides and methacrylamides substituted on the nitrogen with an alkyl radical,
- b) at least one acidic comonomer containing at least one reactive carboxylic group, and
- c) at least one basic comonomer.

53. The device according to claim 52, wherein the at least one basic comonomer is chosen from esters containing primary, secondary, tertiary and quaternary amine substituents of acrylic and methacrylic acids and the products of quaternization of dimethylaminoethyl methacrylate with a compound chosen from dimethyl and diethyl sulphate.

54. The device according to claim 29, wherein the at least one film-forming polymer (B) is chosen from nonionic polymers chosen from:

- polyalkyloxazolines;
- vinyl acetate homopolymers;
- copolymers derived from (i) vinyl acetate and (ii) acrylic ester;
- copolymers derived from (i) vinyl acetate and (ii) ethylene;
- copolymers derived from (i) vinyl acetate and (ii) maleic ester;
- copolymers derived from (i) polyethylene and (ii) maleic anhydride;
- alkyl acrylate homopolymers and alkyl methacrylate homopolymers;

- acrylic ester copolymers;
- copolymers derived from (i) acrylonitrile and (ii) a nonionic monomer; and
- copolymers derived from (i) alkyl acrylate and (ii) urethane.

55. The device according to claim 54, wherein said acrylic ester copolymers are derived from monomers chosen from alkyl acrylates and alkyl methacrylates.

56. The device according to claim 54, wherein said copolymers derived from (i) acrylonitrile and (ii) a nonionic monomer are chosen from copolymers derived from (i) butadiene and (ii) alkyl (meth)acrylates.

57. The device according to claim 29, wherein the at least one film-forming polymer (B) is chosen from cationic polymers chosen from:

- copolymers derived from (i) acrylamide and (ii) dimethylaminoethyl methacrylate quaternized with dimethyl sulphate,
- copolymers derived from (i) acrylamide and (ii) methacryloyloxyethyltrimethylammonium chloride,
- copolymers derived from (i) acrylamide and (ii) methacryloyloxyethyl trimethylammonium methosulphate,
- quaternized and non-quaternized vinylpyrrolidone/dialkylaminoalkyl (meth)acrylate copolymers,

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- dimethylaminoethyl methacrylate/vinyl caprolactam/vinylpyrrolidone terpolymers, and
- vinylpyrrolidone/quaternized dimethylaminopropylmethacrylamide copolymers.

58. The device according to claim 29, wherein the at least one film-forming polymer (B) is chosen from grafted silicone polymers comprising a polysiloxane portion and a non-silicone organic chain portion.

59. The device according to claim 29, wherein the at least one film-forming polymer (B) is chosen from functionalized and non-functionalized, silicone and non-silicone polyurethanes, said polyurethanes being different from said at least one polycondensate (A).

60. The device according to claim 29, wherein said device delivers an amount of composition ranging from 120 to and 170 μ l when the user presses once on the push-button.

61. The device according to claim 60, wherein said amount ranges from 140 to 160 μ l.

62. The device according to claim 29, wherein the composition also contains at least one conventional cosmetic additive chosen from fatty substances, thickeners, softeners, antifoaming agents, moisturizers, antiperspirants, basifying agents, dyes, pigments, fragrances, preserving agents, surfactants, volatile and non-volatile silicones.

63. The device according to claim 29, wherein the composition also contains at least one conventional cosmetic additive is chosen from anionic silicones, polyols, proteins and vitamins.

64. The device according to claim 29, wherein the average diameter of the droplets is less than or equal to 75 μm .

65. The device according to claim 29, wherein the dispenser device comprises a pump dispenser device.

66. The device according to claim 29, wherein the composition comprises, as a relative proportion by weight, from 0.5 to 20% of the at least one polycondensate (A).

67. The device according to claim 29, wherein the composition comprises, as a relative proportion by weight, from 1 to 10% of the at least one polycondensate (A).

68. The device according to claim 29, wherein the composition comprises, as a relative proportion by weight, from 0.5 to 20% of the at least one film forming polymer (B).

69. The device according to claim 29, wherein the composition comprises, as a relative proportion by weight, from 1 to 10% of the at least one film forming polymer (B).-

REMARKS


Claims 1 to 26 have been canceled. Claims 27 to 69 have been added. The amendments are fully supported by the original application disclosure. No new matter has been added.

If the Examiner believes a telephone conference would be helpful in advancing the prosecution of this application, the Examiner is respectfully urged to contact applicant's undersigned representative at (202) 408-4082.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

By: 
Thomas L. Irving
Reg. No. 28,619

Dated: July 17, 2000

PUMP-DISPENSER BOTTLE DEVICE CONTAINING A
POLYCONDENSATE COMPRISING AT LEAST ONE POLYURETHANE
AND/OR POLYUREA UNIT

5 The invention relates to pump-dispenser
bottle devices comprising a reservoir which contains,
in a cosmetically acceptable medium, a multiblock
polymer (A) comprising at least one polyurethane and/or
polyurea unit and a film-forming polymer (B), the
10 polymers (A) and (B) and the device being chosen so as
to obtain, on leaving the device, droplets of
composition with an average diameter of less than
80 μ m. The invention is also directed towards a process
for shaping or holding the hairstyle comprising the use
15 of these devices, and towards their use for the
manufacture of a hair styling product.

Fixing of the hairstyle is an important
element of styling which consists in maintaining the
shape already given or in shaping the hair and fixing
20 it simultaneously.

The hair products for shaping and/or
maintaining the hairstyle which are the most common on
the cosmetics market are spray compositions consisting
essentially of a solution, usually an alcoholic and/or
25 aqueous solution, and one or more materials, generally
polymer resins, the function of which is to form welds
between the hairs, these materials also being known as
fixing materials, as a mixture with various cosmetic
adjuvants. This solution can be packaged, for example,

in a pump-dispenser bottle.

To satisfy the environmental protection obligations, compositions for fixing the hairstyle need to discharge fewer and fewer volatile organic compounds (VOCs). To this end, the amount of volatile organic solvents in the composition is reduced and these solvents are replaced with water. However, this change of the formulation of hair compositions has the harmful effect of greatly increasing their viscosity.

10 Packaging in pump-dispenser bottle form is especially practical for users who can easily measure out the amount of product which they wish to apply. However, this type of packaging occasionally makes it difficult to apply the product uniformly on the hair, 15 since the droplets of product leaving the pump-dispenser bottle are often too large. This drawback is particularly pronounced for viscous compositions for which fine droplets are difficult to obtain.

The quality of the spraying obtained by means 20 of a pump-dispenser bottle device, i.e. essentially the distribution of the droplets in space at the nozzle outlet, depends greatly on the chemical constitution of the composition used. Most particular advantage is thus given to the preparation of pump-dispenser bottle 25 devices which give rise to fine droplets, despite a high viscosity of the compositions.

Patent DE 195 41 326 discloses the preparation of styling compositions comprising a polymer containing polyurethane units as fixing

polymer. However, the devices can be improved in particular as regards the cosmetic properties which they give to the hair, while at the same time offering better spraying quality.

5 Against all expectation, the Applicant has discovered, surprisingly and unexpectedly, that it is possible to prepare pump-dispenser bottle devices which satisfy the requirements expressed above, by carrying out a selection, on the one hand, on the cosmetic
10 composition, and, on the other hand, on the means for distributing this composition.

 A subject of the invention is a pump-dispenser bottle device comprising a reservoir containing a hair composition, as well as means for
15 distributing the composition, characterized in that:
 (1) the composition comprises, in a cosmetically acceptable medium, at least one polycondensate (A) comprising at least one polyurethane and/or polyurea block and at least one film-forming polymer (B) which
20 is different from (A);
 (2) the polymers (A) and (B) and the device being chosen so as to obtain, on leaving the device, droplets of composition with an average diameter of less than or equal to 80 μm .

25 Another subject of the invention relates to a process for shaping or holding the hairstyle comprising the use of this pump-dispenser bottle device.

 Yet another subject of the invention relates to the use of this device for the manufacture of a hair

styling product.

The polycondensates comprising at least one polyurethane and/or polyurea block which are particularly targeted by the present invention are
5 those described in the patents EP 0,751,162, EP 0,637,600, FR 2,743,297 and EP 0,648,485 of which the Applicant is the proprietor, as well as the patents EP 0,656,021 or WO 94/03510 from the company BASF and EP 0,619,111 from the company National Starch.

10 The polycondensates used in accordance with the invention can be soluble in the cosmetically acceptable medium, in particular after neutralization with an organic or inorganic base, or alternatively can form a dispersion in this medium. In this case, the
15 dispersion can comprise at least 0.05% of surfactant which allows the polycondensate to form a dispersion and to be maintained in dispersion.

According to the invention, any type of surfactant can be used in the said dispersion, but
20 preferably a nonionic surfactant. The average size of the polycondensate particles in the dispersion is preferably between 0.1 and 1 micron.

By way of example, the polycondensate can be formed by an arrangement of blocks, this arrangement
25 being obtained in particular from:

- (1) at least one compound which contains two or more than two active hydrogen atoms per molecule;
- (2) at least one diol or a mixture of diols containing acid radicals or their salts;

(3) at least one di- or polyisocyanate.

Advantageously, the compounds (1) are chosen from the group comprising diols, diamines, polyesterols and polyetherols, or a mixture thereof.

5 The compounds (1) which are preferred are the linear polyethylene and polypropylene glycols, in particular those which are obtained by a reaction of ethylene oxide or propylene oxide with water or diethylene or dipropylene glycol in the presence of
10 sodium hydroxide as catalyst. These polyglycols generally have a molecular weight of between about 600 and 20,000.

Other preferred organic compounds are those which have mercapto, amino, carboxyl or hydroxyl
15 groups. Among these, mention may be made more particularly of polyhydroxy compounds such as polyether diols, polyester diols, polyacetal diols, polyamide diols, polyesterpolyamide diols, poly(alkylene ether) diols, polythioether diols and polycarbonate diols.

20 The preferred polyether diols are, for example, the condensation products of ethylene oxide, of propylene oxide or of tetrahydrofuran, their copolymerization or condensation products, which may be grafted or blocks, such as mixtures of condensates of
25 ethylene oxide and propylene oxide, and the products of polymerization of olefins, at high pressure, with alkylene oxide condensates. Suitable polyethers are prepared, for example, by condensation of alkylene oxides and polyhydric alcohols, such as ethylene

glycol, 1,2-propylene glycol and 1,4-butanediol.

The polyester diols, polyesteramides and polyamide diols are preferably saturated and are obtained, for example, from the reaction of saturated
 5 or unsaturated polycarboxylic acids with polyhydric alcohols, diamines or polyamines. Adipic acid, succinic acid, phthalic acid, terephthalic acid and maleic acid can be used, for example, to prepare these compounds. Polyhydric alcohols that are suitable for preparing the
 10 polyesters include, for example, ethylene glycol, 1,2-propylene glycol, 1,4-butanediol, neopentyl glycol and hexanediol. Amino alcohols, for example ethanolamine, can also be used. Diamines that are suitable for preparing the polyesteramides are
 15 ethylenediamine and hexamethylenediamine.

Suitable polyacetals can be prepared, for example, from 1,4-butanediol or from hexanediol and from formaldehyde. Suitable polythioethers can be prepared, for example, by condensation reaction between
 20 thioglycols, either alone or in combination with other glycols such as ethylene glycol, 1,2-propylene glycol or with other polyhydroxylated compounds. Polyhydroxylated compounds already containing urea or urethane groups, natural polyols, which can be further
 25 modified, for example castor oil and carbohydrates, can also be used.

More preferably, the compound of group (1) is a polyesterol, -in particular a polyester diol formed by the reaction of at least one (di)polyol (1_a) and at

least one acid (1_b). The (di)polyol (1_a) is chosen in particular from the group comprising neopentyl glycol, 1,4-butanediol, hexanediol, ethylene glycol, diethylene glycol, propylene glycol, butylene glycol, neopentyl glycol and (di)polyethylene glycol. The acid (1_b) is chosen in particular from the group comprising phthalic acid, isophthalic acid, adipic acid and (poly)lactic acid.

A hydroxycarboxylic acid such as dimethylolpropanoic acid (DMPA) or a 2,2-hydroxymethylcarboxylic acid can be used in particular as compound (2). In general, the compound (2) is useful as a coupling block. The preferred compounds (2) are those comprising at least one poly(α -hydroxydiolcarboxylic acid).

The compounds (2) which are particularly preferred in accordance with the invention are those chosen from the group comprising 2,2-di(hydroxymethyl)acetic acid, 2,2-dihydroxymethylpropionic acid, 2,2-dihydroxymethylbutyric acid and 2,2-dihydroxymethylpentanoic acid.

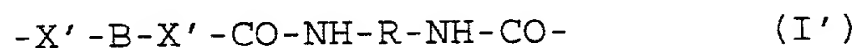
The di- or polyisocyanate (3) can be chosen in particular from the group comprising hexamethylene diisocyanate, isophorone diisocyanate (IPDI), toluylene diisocyanate, diphenylmethane 4,4'-diisocyanate (DPMD) and dicyclohexylmethane 4,4'-diisocyanate (DCMD), methylenebis(p-phenyl) diisocyanate, methylenebis(4-cyclohexyl isocyanate), isophorone diisocyanate, toluene diisocyanate, 1,5-naphthalene diisocyanate, 4,4'-diphenylmethane diisocyanate,

2,2'-dimethyl-4,4'-diphenylmethane diisocyanate,
 1,3-phenylene diisocyanate, 1,4-phenylene diisocyanate,
 mixtures of 2,4- and 2,6-toluene diisocyanate,
 2,2'-dichloro-4,4'-diisocyanatodiphenylmethane,
 5 2,4-dibromo-1,5-diisocyanatonaphthalene, butane
 1,4-diisocyanate, 1,6-hexane diisocyanate and
 1,4-cyclohexane diisocyanate.

The polycondensate can be formed using an
 additional compound (4) which generally serves to
 10 extend the polycondensate chain. These compounds (4)
 can be chosen from the group comprising, in particular,
 saturated or unsaturated glycols such as ethylene
 glycol, diethylene glycol, neopentyl glycol or
 triethylene glycol, amino alcohols such as
 15 ethanolamine, propanolamine or butanolamine,
 heterocyclic, aromatic, cycloaliphatic and aliphatic
 primary amines, diamines, carboxylic acids such as
 aliphatic, aromatic or heterocyclic carboxylic acids,
 for instance oxalic acid, succinic acid, glutaric acid,
 20 adipic acid, sebacic acid or terephthalic acid, and
 aminocarboxylic acids. The preferred compounds (4) are
 aliphatic diols.

The polycondensates in accordance with the
 invention can also be formed from additional compounds
 25 (5) having a silicone skeleton, such as polysiloxanes,
 polyalkylsiloxanes or polyarylsiloxanes, in particular
 polyethylsiloxanes, polymethylsiloxanes and
 polyphenylsiloxanes, optionally containing hydrocarbon-
 based chains grafted onto the silicon atoms.

The polyurethane and/or polyurea blocks of the polymer used advantageously have a repeating base unit corresponding to the general formula below:

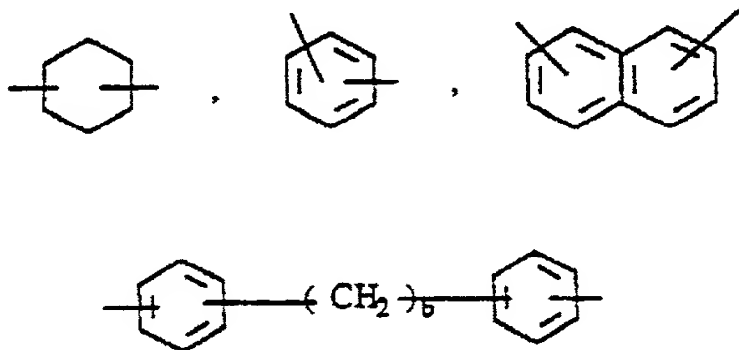


5 in which:

- X' represents O and/or NH,
- B is a divalent hydrocarbon-based radical, this radical being substituted or unsubstituted, and
- 10 - R is a divalent radical chosen from alkylene radicals of aromatic type, C₁ to C₂₀ aliphatic radicals or C₁ to C₂₀ cycloaliphatic radicals, these radicals being substituted or unsubstituted.

Preferably, the radical B is a C₁ to C₃₀ radical and bears a group containing one or more carboxylic functions and/or one or more sulphonic functions, the said carboxylic and/or sulphonic functions being in free form or else partially or totally neutralized with an inorganic or organic base.

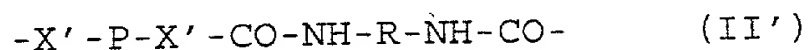
20 The radical R is advantageously chosen from the radicals corresponding to the following formulae:



in which b is an integer between 0 and 3 and c is an integer between 1 and 20, preferably between 2 and 12.

In particular, the radical R is chosen from hexamethylene, 4,4'-biphenylenemethane, 2,4- and/or
 5 2,6-tolylene, 1,5-naphthylene, p-phenylene and methylene-4,4-bis-cyclohexyl radicals and the divalent radical derived from isophorone.

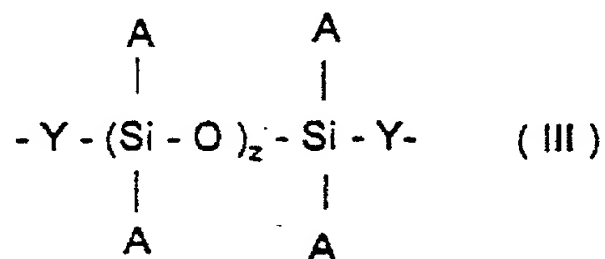
The polycondensate used in accordance with the invention comprising at least one polyurethane
 10 and/or polyurea block can advantageously also comprise at least one polysiloxane block in which the repeating base unit corresponds, for example, to the general formula (II') below:



15 in which:

- P is a polysiloxane segment,
- X' represents O and/or NH, and
- R is a divalent radical chosen from alkylene radicals of aromatic type, C₁ to C₂₀ aliphatic
 20 radicals and C₁ to C₂₀ cycloaliphatic radicals, these radicals being substituted or unsubstituted.

Advantageously, the polysiloxane segment P corresponds to the general formula below:



in which:

- the radicals A, which can be identical or different, are chosen from, on the one hand, C_1 to C_{20} monovalent hydrocarbon-based radicals which are free or
5 substantially free of ethylenic unsaturation and, on the other hand, aromatic radicals,
- Y represents a divalent hydrocarbon-based radical, and
- z represents an integer chosen such that the
10 average molecular weight of the polysiloxane segment is between 300 and 10,000.

In general, the divalent radical Y is chosen from alkylene radicals of formula $-(CH_2)_a-$, in which a represents an integer which can be between 1 and 10.

15 The radicals A can be chosen from alkyl radicals, in particular methyl, ethyl, propyl, isopropyl, butyl, pentyl, hexyl, octyl, decyl, dodecyl and octadecyl radicals, cycloalkyl radicals, in particular the cyclohexyl radical, aryl radicals, in
20 particular phenyl and naphthyl, arylalkyl radicals, in particular benzyl and phenylethyl, and tolyl and xylyl radicals.

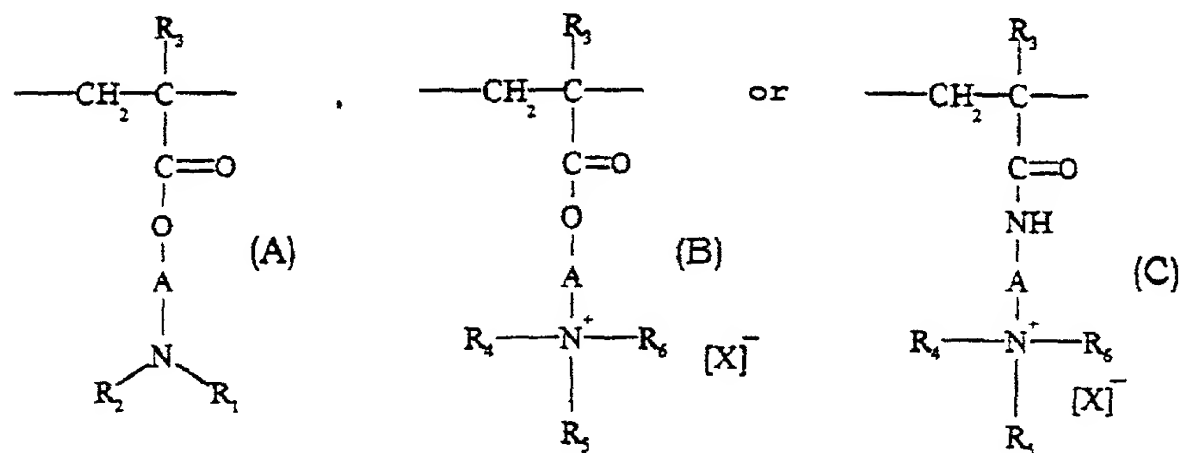
The cationic, anionic, amphoteric and nonionic film-forming polymers (B) which can be used in
25 accordance with the invention are described below.

The cationic film-forming polymers which can be used according to the present invention are preferably chosen from polymers containing primary, secondary, tertiary and/or quaternary amine groups

forming part of the polymer chain or directly attached thereto, and having a molecular weight of between 500 and about 5,000,000 and preferably between 1000 and 3,000,000.

- 5 Among these polymers, mention may be made more particularly of the following cationic polymers:
 (1) homopolymers or copolymers derived from acrylic or methacrylic esters or amides and containing at least one of the units of the following formulae:

10



in which:

R₃ denotes a hydrogen atom or a CH₃ radical;

- 15 A is a linear or branched alkyl group of 1 to 6 carbon atoms or a hydroxyalkyl group of 1 to 4 carbon atoms;
 R₄, R₅ and R₆, which may be identical or different, represent an alkyl group having from 1 to 18 carbon atoms or a benzyl radical;

- 20 R₁ and R₂ represent hydrogen or an alkyl group having from 1 to 6 carbon atoms;
 X denotes a methosulphate anion or a halide such as chloride or bromide.

The copolymers of the family (1) also contain one or more units derived from comonomers which can be chosen from the family of acrylamides, methacrylamides, diacetone acrylamides, acrylamides and methacrylamides substituted on the nitrogen with lower alkyls, acrylic or methacrylic acids or esters thereof, vinyl lactams such as vinylpyrrolidone or vinylcaprolactam, and vinyl esters.

Thus, among these copolymers of the family (1), mention may be made of:

- copolymers of acrylamide and of dimethylaminoethyl methacrylate quaternized with dimethyl sulphate or with a dimethyl halide, such as the one sold under the name Hercofloc by the company Hercules,
- copolymers of acrylamide and of methacryloyloxyethyltrimethylammonium chloride, described, for example, in patent application EP-A-080,976 and sold under the name Bina Quat P 100 by the company Ciba Geigy,
- the copolymer of acrylamide and of methacryloyloxyethyltrimethylammonium methosulphate, sold under the name Reten by the company Hercules,
- vinylpyrrolidone/dialkylaminoalkyl acrylate or methacrylate copolymers which are or are not quaternized, such as the products sold under the name "Gafquat" by the company ISP, such as, for example, "Gafquat 734" or "Gafquat 755" or alternatively the products known as "Copolymer 845, 958 and 937". These polymers are described in detail in French patents 2,077,143 and 2,393,573,

- dimethylaminoethyl methacrylate/vinylcaprolactam/
vinylpyrrolidone terpolymers, such as the product sold
under the name Gaffix VC 713 by the company ISP, and
- the quaternized vinylpyrrolidone/dimethylamino-
5 propylmethacrylamide copolymer, such as the product
sold under the name "Gafquat HS 100" by the company
ISP;

(2) the quaternized polysaccharides described more
10 particularly in US patents 3,589,578 and 4,031,307,
such as guar gums containing cationic trialkylammonium
groups.

Such products are sold in particular under
the trade names Jaguar C 13 S, Jaguar C 15 and Jaguar
15 C 17 by the company Meyhall.

(3) quaternized copolymers of vinylpyrrolidone and of
vinylimidazole, such as the products sold by BASF under
the name Luviquat TFC;

20

(4) chitosans or salts thereof;
the salts which can be used are, in particular,
chitosan acetate, lactate, glutamate, gluconate or
pyrrolidonecarboxylate.

25 Among these compounds, mention may be made of
chitosan having a degree of deacetylation of 90.5% by
weight, sold under the name Kytan Brut Standard by the
company Aber Technologies, and chitosan pyrrolidone-
carboxylate sold under the name Kytamer PC by the

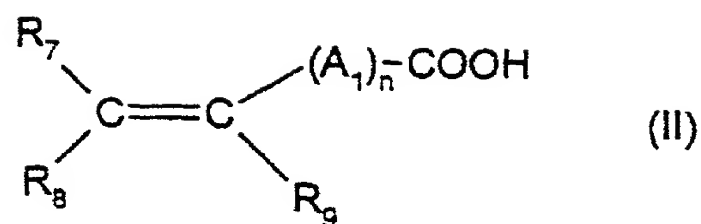
company Amerchol.

(5) Cationic cellulose derivatives, such as cellulose copolymers or cellulose derivatives grafted with a water-soluble monomer comprising a quaternary ammonium, which are described in particular in US patent 4,131,576, such as hydroxyalkyl celluloses, for instance hydroxymethyl, hydroxyethyl or hydroxypropyl cellulose grafted in particular with a methacryloyloxyethyltrimethylammonium, methacrylamidopropyltrimethylammonium or dimethyldiallylammonium salt.

The commercial products corresponding to this definition are, more particularly, the products sold under the names ACelquat L 200" and ACelquat H 100" by the company National Starch.

The anionic film-forming polymers generally used are polymers containing groups derived from carboxylic acid, sulphonic acid or phosphoric acid and have a weight-average molecular weight of approximately between 500 and 5,000,000.

1) The carboxylic groups are provided by unsaturated mono- or dicarboxylic acid monomers such as those corresponding to the formula:



in which n is an integer from 0 to 10, A₁ denotes a methylene group, optionally connected to the carbon atom of the unsaturated group, or to the neighbouring methylene group when n is greater than 1, via a hetero atom such as oxygen or sulphur, R₇ denotes a hydrogen atom or a phenyl or benzyl group, R₈ denotes a hydrogen atom or a lower alkyl or carboxyl group, R₉ denotes a hydrogen atom, a lower alkyl group or a -CH₂-COOH, phenyl or benzyl group;

In the abovementioned formula, a lower alkyl radical preferably denotes a group having 1 to 4 carbon atoms and in particular methyl and ethyl.

The anionic film-forming polymers containing carboxylic groups which are preferred according to the invention are:

A) acrylic or methacrylic acid homo- or copolymers, or salts thereof and in particular the products sold under the names Versicol E or K by the company Allied Colloid and Ultrahold by the company BASF. The copolymers of acrylic acid and of acrylamide sold in the form of their sodium salt under the names Reten 421, 423 or 425 by the company Hercules, the sodium salts of polyhydroxycarboxylic acids.

B) copolymers of acrylic or methacrylic acids with a

monoethylenic monomer such as ethylene, styrene, vinyl esters, acrylic or methacrylic acid esters, optionally grafted onto a polyalkylene glycol such as polyethylene glycol and optionally crosslinked. Such polymers are

5 described in particular in French patent 1,222,944 and German patent application 2,330,956, the copolymers of this type containing an optionally N-alkylated and/or hydroxyalkylated acrylamide unit in their chain as described in particular in Luxembourg patent

10 applications 75370 and 75371 or sold under the name Quadramer by the company American Cyanamid. Mention may also be made of copolymers of acrylic acid and of C₁-C₄ alkyl methacrylate and terpolymers of vinylpyrrolidone, of acrylic acid and of methacrylate of C₁-C₂₀ alkyl, for

15 example lauryl such as the product sold by the company ISP under the name Acrylidone LM and methacrylic acid/ethyl acrylate/tert-butyl acrylate terpolymers such as the product sold under the name Luvimer 100 P by the company BASF.

20 C) copolymers derived from crotonic acid such as those containing vinyl acetate or propionate units in their chain and optionally other monomers such as allylic esters or methallylic esters, vinyl ether or vinyl ester of a linear or branched saturated carboxylic acid

25 with a long hydrocarbon chain such as those containing at least 5 carbon atoms, it being possible for these polymers optionally to be grafted and crosslinked, or alternatively a vinyl, allylic or methallylic ester of an α - or β -cyclic carboxylic acid. Such polymers are

described, inter alia, in French patents 1,222,944, 1,580,545, 2,265,782, 2,265,781, 1,564,110 and 2,439,798. Commercial products falling into this class are the resins 28-29-30, 26-13-14 and 28-13-10 sold by
5 the company National Starch.

D) copolymers derived from C_4 - C_8 monounsaturated carboxylic acids or anhydrides chosen from:

- copolymers comprising (i) one or more maleic, fumaric or itaconic acids or anhydrides and (ii) at least one
10 monomer chosen from vinyl esters, vinyl ethers, vinyl halides, phenylvinyl derivatives, acrylic acid and esters thereof, the anhydride functions of these copolymers optionally being monoesterified or monoamidated. Such polymers are described in particular
15 in US patents 2,047,398, 2,723,248 and 2,102,113 and GB patent 839,805 and in particular those sold under the names Gantrez AN or ES by the company ISP.

- copolymers comprising (i) one or more maleic,
20 citraconic or itaconic anhydrides and (ii) one or more monomers chosen from allylic or methallylic esters optionally containing one or more acrylamide, methacrylamide, α -olefin, acrylic or methacrylic ester, acrylic or methacrylic acid or vinylpyrrolidone groups
25 in their chain,
the anhydride functions of these copolymers optionally being monoesterified or monoamidated.

These polymers are described, for example, in French patents 2,350,384 and 2,357,241 by the

Applicant.

E) polyacrylamides containing carboxylate groups.

The polymers comprising sulphonic groups are polymers containing vinylsulphonic, styrenesulphonic, naphthalenesulphonic or acrylamidoalkylsulphonic units.

These polymers can be chosen in particular from:

- polyvinylsulphonic acid salts having a weight-average molecular weight of approximately between 1000 and 100,000, as well as the copolymers with an unsaturated comonomer such as acrylic or methacrylic acids and their esters, as well as acrylamide or its derivatives, vinyl ethers and vinylpyrrolidone;
- polystyrenesulphonic acid salts, the sodium salts having a weight-average molecular weight of about 500,000 and about 100,000, which are sold respectively under the names Flexan 500 and Flexan 130 by National Starch. These compounds are described in patent FR 2,198,719;
- polyacrylamidesulphonic acid salts, those mentioned in US patent 4,128,631 and more particularly polyacrylamidoethylpropanesulphonic acid sold under the name Cosmedia Polymer HSP 1180 by Henkel.

According to the invention, the anionic film-forming polymers are preferably chosen from acrylic acid copolymers, such as the acrylic acid/ethyl acrylate/N-tert-butylacrylamide terpolymer sold under the name Ultrahold Strong by the company BASF, copolymers derived from crotonic acid, such as the

vinyl acetate/vinyl tert-butylbenzoate/crotonic acid
 terpolymers and the crotonic acid/vinyl acetate/vinyl
 neodecanoate terpolymers sold under the name Resin
 28-29-30 by the company National Starch, polymers
 5 derived from maleic, fumaric or itaconic acids or
 anhydrides with vinyl esters, vinyl ethers, vinyl
 halides, phenylvinyl derivatives and acrylic acid and
 esters thereof, such as the methyl vinyl
 ether/monoesterified maleic anhydride copolymer sold
 10 under the name Gantrez ES 425 by the company ISP, the
 copolymers of methacrylic acid and methyl methacrylate
 sold under the name Eudragit L by the company Rohm
 Pharma, the copolymer of methacrylic acid and ethyl
 acrylate sold under the name Luvimer MAEX or MAE by the
 15 company BASF and the vinyl acetate/crotonic acid
 copolymer sold under the name Luviset CA 66 by the
 company BASF and the vinyl acetate/crotonic acid
 copolymer grafted with polyethylene glycol under the
 name Aristoflex A by the company BASF.

20 The anionic film-forming polymers which are
 most particularly preferred are chosen from the methyl
 vinyl ether/monoesterified maleic anhydride copolymer
 sold under the name Gantrez ES 425 by the company ISP,
 the acrylic acid/ethyl acrylate/N-tert-butylacrylamide
 25 terpolymer sold under the name Ultrahold Strong by the
 company BASF, the copolymers of methacrylic acid and
 methyl methacrylate sold under the name Eudragit L by
 the company Rohm Pharma, the vinyl acetate/vinyl tert-
 butylbenzoate/crotonic acid terpolymers and the

crotonic acid/vinyl acetate/vinyl neodecanoate
 terpolymers sold under the name Resin 28-29-30 by the
 company National Starch, the copolymer of methacrylic
 acid and ethyl acrylate sold under the name Luvimer
 5 MAEX or MAE by the company BASF and the
 vinylpyrrolidone/acrylic acid/lauryl methacrylate
 terpolymer sold under the name Acrylidone LM by the
 company ISP.

The amphoteric film-forming polymers which
 10 can be used in accordance with the invention can be
 chosen from polymers containing units B and C
 distributed randomly in the polymer chain, in which B
 denotes a unit derived from a monomer containing at
 least one basic nitrogen atom and C denotes a unit
 15 derived from an acid monomer containing one or more
 carboxylic or sulphonic groups, or alternatively B and
 C can denote groups derived from carboxybetaine or
 sulphobetaine zwitterionic monomers;
 B and C can also denote a cationic polymer chain
 20 containing primary, secondary, tertiary or quaternary
 amine groups, in which at least one of the amine groups
 bears a carboxylic or sulphonic group connected via a
 hydrocarbon radical or alternatively B and C form part
 of a chain of a polymer containing an α,β -dicarboxylic
 25 ethylene unit in which one of the carboxylic groups has
 been made to react with a polyamine containing one or
 more primary or secondary amine groups.

The amphoteric film-forming polymers
 corresponding to the definition given above which are

more particularly preferred are chosen from the following polymers:

(1) polymers resulting from the copolymerization of a monomer derived from a vinyl compound bearing a carboxylic group such as, more particularly, acrylic acid, methacrylic acid, maleic acid, α -chloroacrylic acid, and a basic monomer derived from a substituted vinyl compound containing at least one basic atom, such as, more particularly, dialkylaminoalkyl methacrylates and acrylates, dialkylaminoalkylmethacrylamides and -acrylamides. Such compounds are described in US patent No. 3,836,537.

(2) polymers containing units derived from:

a) at least one monomer chosen from acrylamides and methacrylamides substituted on the nitrogen with an alkyl radical,

b) at least one acidic comonomer containing one or more reactive carboxylic groups, and

c) at least one basic comonomer such as esters containing primary, secondary, tertiary and quaternary amine substituents of acrylic and methacrylic acids and the product of quaternization of dimethylaminoethyl methacrylate with dimethyl or diethyl sulphate.

The N-substituted acrylamides or methacrylamides which are more particularly preferred

according to the invention are groups in which the alkyl radicals contain from 2 to 12 carbon atoms and more particularly N-ethylacrylamide, N-tert-butylacrylamide, N-tert-octylacrylamide,
 5 N-octylacrylamide, N-decylacrylamide, N-dodecylacrylamide and the corresponding methacrylamides.

The acidic comonomers are chosen more particularly from acrylic acid, methacrylic acid,
 10 crotonic acid, itaconic acid, maleic acid and fumaric acid and alkyl monoesters, having 1 to 4 carbon atoms, of maleic or fumaric acids or anhydrides.

The preferred basic comonomers are aminoethyl, butylaminoethyl, N,N'-dimethylaminoethyl
 15 and N-tert-butylaminoethyl methacrylates.

The copolymers whose CTFA (4th edition, 1991) name is octylacrylamide/acrylates/butylaminoethyl methacrylate copolymer such as the products sold under the name Amphomer or Lovocryl 47 by the company
 20 National Starch are particularly used.

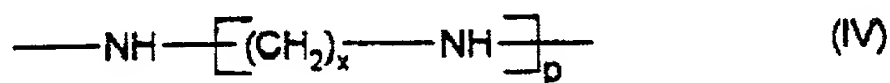
(3) crosslinked and alkylated polyamino amides partially or totally derived from polyamino amides of general formula:

25



in which R_{10} represents a divalent radical derived from

a saturated dicarboxylic acid, a mono- or dicarboxylic aliphatic acid containing an ethylenic double bond, an ester of a lower alkanol, having 1 to 6 carbon atoms, of these acids or a radical derived from the addition
 5 of any one of the said acids to a bis(primary) or bis(secondary) amine, and Z denotes a bis(primary), mono- or bis(secondary) polyalkylene-polyamine radical and preferably represents:



10

a) in proportions of from 60 to 100 mol%, the radical where $x = 2$ and $p = 2$ or 3, or alternatively $x = 3$ and $p = 2$

15 this radical being derived from diethylenetriamine, from triethylenetetraamine or from dipropylenetriamine;

b) in proportions of from 0 to 40 mol%, the radical (IV) above in which $x = 2$ and $p = 1$ and which is
 20 derived from ethylenediamine, or the radical derived from piperazine:



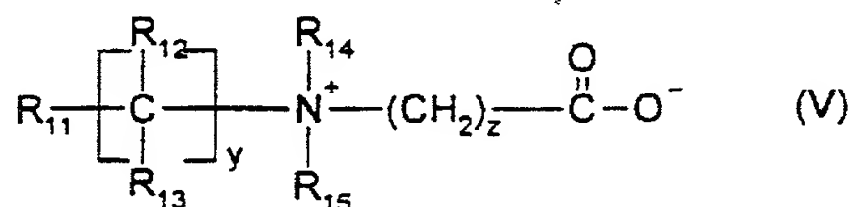
25 c) in proportions of from 0 to 20 mol%, the -NH-(CH₂)₆-NH- radical derived from hexamethylenediamine, these polyaminoamines being

crosslinked by addition of a difunctional crosslinking agent chosen from epihalohydrins, diepoxides, dianhydrides and bis-unsaturated derivatives, using from 0.025 to 0.35 mol of crosslinking agent per amine
 5 group of the polyamino amide and alkylated by the action of acrylic acid, chloroacetic acid or an alkane sultone, or salts thereof.

The saturated carboxylic acids are preferably chosen from acids having 6 to 10 carbon atoms, such as
 10 adipic acid, 2,2,4-trimethyladipic acid and 2,4,4-trimethyladipic acid, terephthalic acid, acids containing an ethylenic double bond such as, for example, acrylic acid, methacrylic acid and itaconic acid.

15 The alkane sultones used in the alkylation are preferably propane sultone or butane sultone, the salts of the alkylating agents are preferably the sodium or potassium salts.

20 (4) polymers containing zwitterionic units of formula:



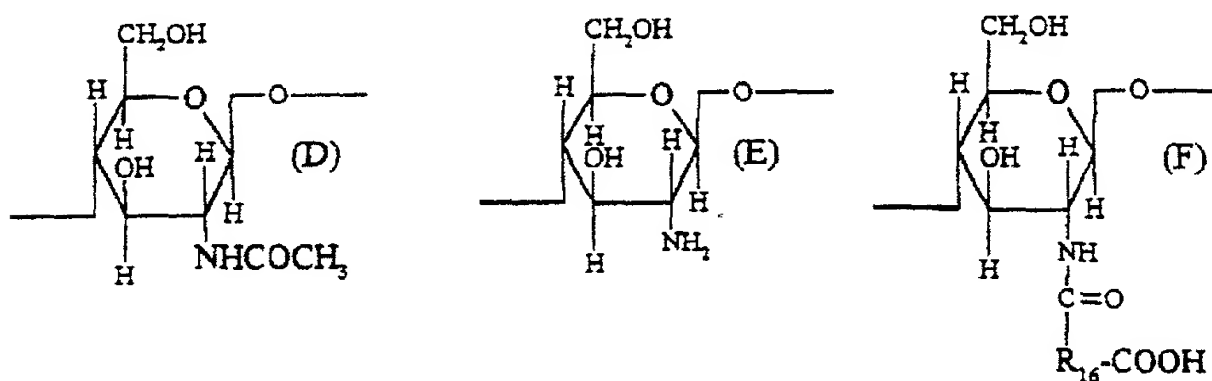
in which R_{11} denotes a polymerizable unsaturated group
 25 such as an acrylate, methacrylate, acrylamide or methacrylamide group, y and z represent an integer from

1 to 3, R_{12} and R_{13} represent a hydrogen atom, methyl, ethyl or propyl, R_{14} and R_{15} represent a hydrogen atom or an alkyl radical such that the sum of the carbon atoms in R_{14} and R_{15} does not exceed 10.

5 The polymers comprising such units can also contain units derived from non-zwitterionic monomers such as dimethyl or diethylaminoethyl acrylate or methacrylate or alkyl acrylates or methacrylates, acrylamides or methacrylamides or vinyl acetate.

10 By way of example, mention may be made of the copolymer of methyl methacrylate/dimethyl carboxymethylammonio methyl ethylmethacrylate such as the product sold under the name Diaformer Z301 by the company Sandoz.

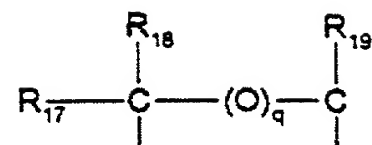
15 (5) polymers derived from chitosan containing monomer units corresponding to the following formulae:



20

the unit D being present in proportions of between 0 and 30%, the unit E in proportions of between 5 and 50% and the unit F-in proportions of between 30 and 90%, it being understood that, in this unit F, R_{16} represents a

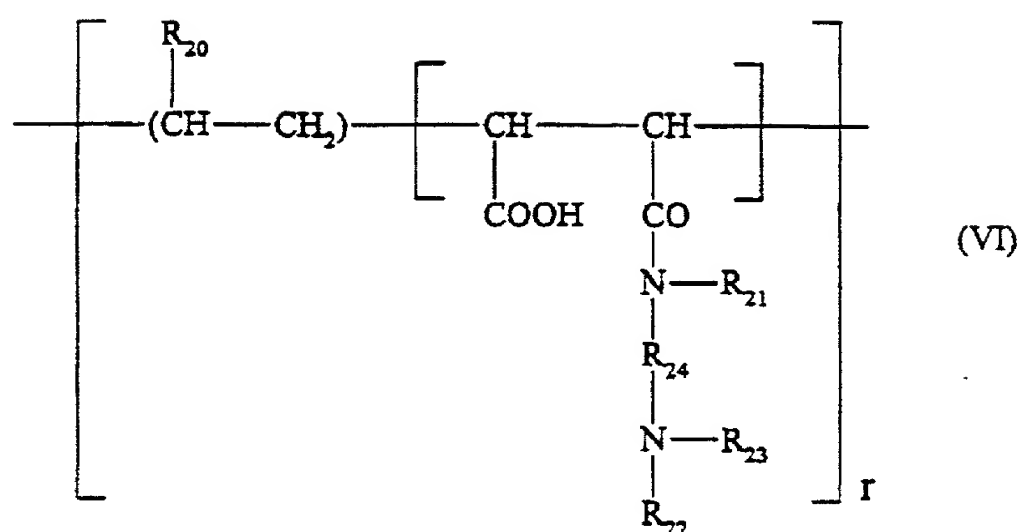
radical of formula:



5 in which, if $q = 0$, R_{17} , R_{18} and R_{19} , which may be identical or different, each represent a hydrogen atom, a methyl, hydroxyl, acetoxy or amino residue, a monoalkylamine residue or a dialkylamine residue which are optionally interrupted by one or more nitrogen
10 atoms and/or optionally substituted with one or more amine, hydroxyl, carboxyl, alkylthio or sulphonic groups, an alkylthio residue in which the alkyl group bears an amino residue, at least one of the radicals R_{17} , R_{18} and R_{19} being, in this case, a hydrogen atom;
15 or, if $q = 1$, R_{17} , R_{18} and R_{19} each represent a hydrogen atom, as well as the salts formed by these compounds with bases or acids.

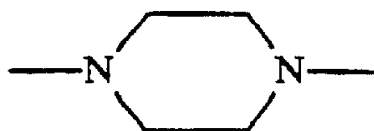
(6) Polymers derived from the N-carboxyalkylation of
20 chitosan, such as N-carboxymethylchitosan or N-carboxybutylchitosan sold under the name "Evalsan" by the company Jan Dekker.

(7) Polymers corresponding to the general formula (VI)
25 are described, for example, in French patent 1,400,366:



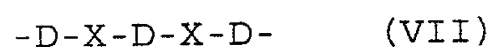
in which R_{20} represents a hydrogen atom, a CH_3O , $\text{CH}_3\text{CH}_2\text{O}$
 or phenyl radical, R_{21} denotes hydrogen or a lower alkyl
 radical such as methyl or ethyl, R_{22} denotes hydrogen or
 a lower alkyl radical such as methyl or ethyl, R_{23}
 denotes a lower alkyl radical such as methyl or ethyl
 or a radical corresponding to the formula: $-R_{24}-\text{N}(\text{R}_{22})_2$,
 R_{24} representing a $-\text{CH}_2-\text{CH}_2-$, $-\text{CH}_2-\text{CH}_2-\text{CH}_2-$ or
 $-\text{CH}_2-\text{CH}(\text{CH}_3)-$ group, R_{22} having the meanings mentioned
 above,
 as well as the higher homologues of these radicals and
 containing up to 6 carbon atoms.

(8) Amphoteric polymers of the type $-\text{D}-\text{X}-\text{D}-\text{X}$ chosen
 from:



a) polymers obtained by the action of chloroacetic acid

or sodium chloroacetate on compounds containing at least one unit of formula:



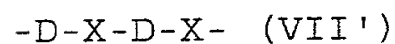
where D denotes a radical

5



and X denotes the symbol E or E', E or E', which may be identical or different, denotes a divalent radical
 10 which is an alkylene radical containing a straight or branched chain containing up to 7 carbon atoms in the main chain, which is unsubstituted or substituted with hydroxyl groups and which can contain, in addition to the oxygen, nitrogen and sulphur atoms, 1 to 3 aromatic
 15 and/or heterocyclic rings; the oxygen, nitrogen and sulphur atoms being present in the form of ether, thioether, sulphoxide, sulphone, sulphonium, alkylamine or alkenylamine groups, hydroxyl, benzylamine, amine oxide, quaternary ammonium, amide, imide, alcohol,
 20 ester and/or urethane groups.

b) Polymers of formula:



in which D denotes a radical

25 and X denotes the symbol E or E' and at least once E'; E having the meaning given above and E' is a divalent radical which is an alkylene radical with a straight or

branched chain having up to 7 carbon atoms in the main chain, which is unsubstituted or substituted with one or more hydroxyl radicals and containing one or more nitrogen atoms, the nitrogen atom being substituted
 5 with an alkyl chain which is optionally interrupted by an oxygen atom and necessarily containing one or more carboxyl functions or one or more hydroxyl functions and betainized by reaction with chloroacetic acid or sodium chloroacetate.

10 (9) (C₁-C₅)alkyl vinyl ether/maleic anhydride copolymers, the maleic anhydride being partially modified by semiamidation with an N,N-dialkylaminoalkylamine such as N,N-dimethyl-aminopropylamine or by semiesterification with an
 15 N,N-dialkanolamine. These copolymers can also contain other vinyl comonomers such as vinylcaprolactam.

The amphoteric film-forming polymers which are particularly preferred according to the invention are those of family (3), such as the copolymers whose
 20 CTFA name is octylacrylamide/acrylates/butylaminoethyl methacrylate copolymer, such as the products sold under the names Amphomer, Amhomer LV 71 or Lovocryl 47 by the company National Starch and those of family (4) such as the copolymer of methyl methacrylate/dimethyl
 25 carboxymethylammonio methyl ethylmethacrylate, sold, for example, under the name Diaformer Z301 by the company Sandoz.

The nonionic film-forming polymers which can be used according to the present invention are chosen,

for example, from:

- vinylpyrrolidone homopolymers;
- copolymers of vinylpyrrolidone and vinyl acetate;
- polyalkyloxazolines such as the polyethyloxazolines
- 5 sold by the company Dow Chemical under the names Peox 50,000, Peox 200,000 and Peox 500,000;
- vinyl acetate homopolymers, such as the product sold under the name Appretan EM by the company Hoechst, or the product sold under the name Rhodopas A 012 by the
- 10 company Rhône-Poulenc;
- copolymers of vinyl acetate and acrylic ester, such as the product sold under the name Rhodopas AD 310 by Rhône-Poulenc;
- copolymers of vinyl acetate and ethylene, such as the
- 15 product sold under the name Appretan TV by the company Hoechst;
- copolymers of vinyl acetate and maleic ester, for example of dibutyl maleate, such as the product sold under the name Appretan MB Extra by the company
- 20 Hoechst;
- copolymers of polyethylene and maleic anhydride;
- alkyl acrylate homopolymers and alkyl methacrylate homopolymers, such as the product sold under the name Micropearl RQ 750 by the company Matsumoto or the
- 25 product sold under the name Luhydran A 848 S by the company BASF;
- acrylic ester copolymers such as, for example, copolymers of alkyl acrylates and alkyl methacrylates, such as the products sold by the company Rohm & Haas

under the names Primal AC-261 K and Eudragit NE 30 D, by the company BASF under the names Acronal 601, Luhydran LR 8833 or 8845, and by the company Hoechst under the names Appretan N 9213 or N 9212;

5 - copolymers of acrylonitrile and a nonionic monomer chosen, for example, from butadiene and alkyl (meth)acrylates; mention may be made of the products sold under the names Nipol LX 531 B by the company Nippon Zeon or those sold under the name CJ 0601 B by the company Rohm & Haas;

- polyurethanes, such as the products sold under the names Acrysol RM 1020 or Acrysol RM 2020 by the company Rohm & Haas, and the products Uraflex XP 401 UZ and Uraflex XP 402 UZ by the company DSM Resins;

15 - copolymers of alkyl acrylate and urethane, such as the product 8538-33 by the company National Starch;
 - polyamides, such as the product Estapor LO 11 sold by the company Rhône-Poulenc;
 - unmodified or chemically modified nonionic guar gums.

20 The unmodified nonionic guar gums are, for example, the products sold under the name Vidogum GH 175 by the company Unipeptine and under the name Jaguar C by the company Meyhall.

The modified nonionic guar gums which can be used according to the invention are preferably modified with C₁-C₆ hydroxyalkyl groups. Mention may be made, for example, of hydroxymethyl, hydroxyethyl, hydroxypropyl and hydroxybutyl groups.

These guar gums are well known in the state

of the art and can be prepared, for example, by reacting corresponding alkene oxides, such as, for example, propylene oxides, with guar gum so as to obtain a guar gum modified with hydroxypropyl groups.

5 Such nonionic guar gums optionally modified with hydroxyalkyl groups are sold, for example, under the trade names Jaguar HP8, Jaguar HP60 and Jaguar HP120, Jaguar DC 293 and Jaguar HP 105 by the company Meyhall or under the name Galactasol 4H4FD2 by the
10 company Aqualon.

 The alkyl radicals of the nonionic polymers have from 1 to 6 carbon atoms except where otherwise mentioned.

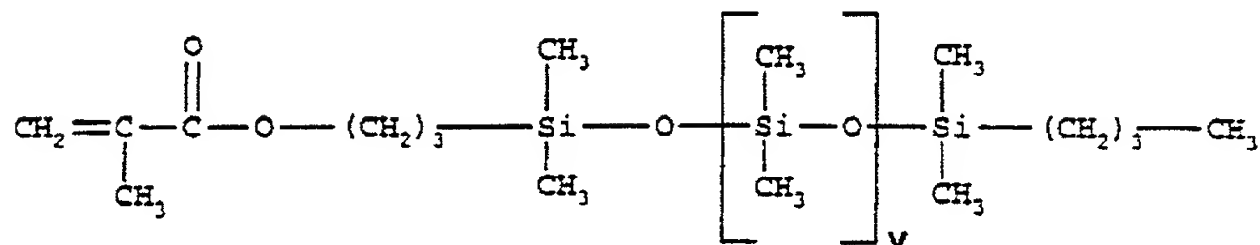
 According to the invention, it is also
15 possible to use film-forming polymers of grafted silicone type comprising a polysiloxane portion and a portion consisting of a non-silicone organic chain, one of the two portions constituting the main polymer chain, the other being grafted onto the said main
20 chain. These polymers are described, for example, in patent applications EP-A-0,412,704, EP-A-0,412,707, EP-A-0,640,105 and WO 95/00578, EP-A-0,582,152 and WO 93/23009 and US patents 4,693,935, 4,728,571 and 4,972,037. These polymers are preferably anionic or
25 nonionic.

 Such polymers are, for example, copolymers which can be obtained by radical polymerization from the monomer mixture consisting of:

a) 50 to 90% by weight of tert-butyl acrylate;

b) 0 to 40% by weight of acrylic acid;

c) 5 to 40% by weight of silicone macromer of formula:



5

with v being a number from 5 to 700; the weight percentages being calculated relative to the total weight of the monomers.

Other examples of grafted silicone polymers are, in particular, polydimethylsiloxanes (PDMSs) onto which are grafted, via a thiopropylene-type connecting chain, mixed polymer units of the poly(meth)acrylic acid type and of the polyalkyl (meth)acrylate type and polydimethylsiloxanes (PDMSs) onto which are grafted, via a thiopropylene-type connecting chain, polymer units of the polyisobutyl (meth)acrylate type.

Film-forming polymers (B) which can also be used are functionalized or non-functionalized, silicone or non-silicone polyurethanes which are different from the polycondensates (A).

The distribution means, which forms a part of the pump-dispenser bottle device, generally consists of at least one pump functioning by suction and/or delivery of liquid and air. This pump is controlled by a distribution head which itself comprises a nozzle via which the composition is vaporized.

According to the invention, the pump-dispenser bottle device advantageously used is one which delivers an amount of composition of between 120 and 170 μ l when the user presses once on the push-button, and preferably an amount of composition of between 140 and 160 μ l.

In accordance with the invention, the droplet diameter is measured for a composition temperature in the region of 20°C inside the pump-dispenser bottle device. In practice, the pump-dispenser bottle device is placed at room temperature and the droplet diameter is measured 20 cm from the nozzle.

The polycondensates used in accordance with the invention may be soluble in the cosmetically acceptable medium or may form a dispersion in this medium. In this case, the dispersion can comprise at least 0.05% of surfactant to allow the placing in dispersion and maintenance in dispersion of the polycondensate.

According to the invention, any type of surfactant can be used in the said dispersion, but preferably a nonionic surfactant. The average size of the polycondensate particles in the dispersion is preferably between 0.1 and 1 micron.

The composition in accordance with the invention advantageously comprises, as a relative proportion by weight relative to the total weight of the composition, between 0.1 and 30% of the polycondensate (A) comprising at least one polyurethane

and/or polyurea block, more advantageously between 0.5 and 20% and even more advantageously between 1 and 10% of this polycondensate.

The composition in accordance with the invention advantageously comprises, as a relative proportion by weight relative to the total weight of the composition, between 0.1 and 30% of the film-forming polymer (B), more advantageously between 0.5 and 20% and even more advantageously between 1 and 10% of film-forming polymer (B).

It can comprise an additional organic solvent in a proportion ranging between 0.5 and 80%.

In accordance with the invention, the organic solvent is chosen in particular from the group comprising C₁ to C₄ alcohols such as ethanol or isopropanol, acetone, methyl ethyl ketone, methyl acetate, butyl acetate, ethyl acetate, dimethoxyethane, diethoxyethane and mixtures thereof. Ethanol is preferably used.

The compositions in accordance with the invention can moreover contain conventional cosmetic additives chosen in particular from fatty substances, thickeners, softeners, antifoaming agents, moisturizers, antiperspirants, basifying agents, dyes, pigments, fragrances, preserving agents, surfactants, polymers other than those of the invention, volatile or non-volatile silicones, in particular anionic silicones, polyols, proteins and vitamins.

A better understanding of the invention may

be gained with the aid of the non-limiting example below.

Example:

The quality of the spraying obtained by means of pump-dispenser bottles in accordance with the invention is compared with that obtained with pump-dispenser bottles of the prior art.

The three pump-dispenser bottles in accordance with the invention all contain the same composition I comprising a polyurethane, and differ from each other in respect of the distribution means.

Composition I:

- Lactic acid/ethylene glycol P
(MIS - EG) - dimethylolpropanoic
acid (DMPA) - isophorone
diisocyanate polyester polycondensate 6.6%
- Polydimethyl/methylsiloxane
containing propylthio-3-
methyacrylate groups/meth-
acrylate/methacrylic acid sold by
3M under the name VS80 0.1 g A.M.
- Aminomethylpropanolqs neutralization
- Ethanol 40%
- Demineralized waterqs 100%

A.M. means active material

The pump-dispenser bottles in accordance with the prior art contain polyurethane-free fixing compositions, namely Mighty Mist[®] sold by L=Oréal and Pantène[®] sold by Procter & Gamble.

The devices below are used to package the compositions:

- Euromist 140 sold by Seaquist, which delivers 140 μ l of composition for each press exerted by the user,
- 5 - Euromist 160 sold by Seaquist, which delivers 160 μ l of composition for each press exerted by the user,
- Perfect PZ11/140 sold by Valois, which delivers 140 μ l of composition for each press exerted by the user.

10 The average diameter of the droplets leaving the pump-dispenser bottles is determined, along with the minimum and maximum diameters. The results are collated in Table 1 below.

Table 1

15

	Average diameter (μ m)	Minimum diameter (μ m)	Maximum diameter (μ m)
Composition I+ Euromist 140	72	67	74
Composition I+ Euromist 160	74	72	76
Composition I+ Perfect PZ11/140	78	76	86
Mighty Mist [®] + Euromist 140	85	81	89
Pantène [®] + Euromist 160	89	85	92

It results therefrom that pump-dispenser

bottles in accordance with the present invention give
finer droplets than the pump-dispenser bottles
according to the prior art. The pump-dispenser bottles
in accordance with the invention thus produce a more
5 homogeneous spraying of the product on the hair than
the pump-dispenser bottles of the prior art.

Claims

1. Pump-dispenser bottle device comprising a reservoir containing a hair composition, as well as means for distributing the composition, characterized in that:

(i) the composition comprises, in a cosmetically acceptable medium, at least one polycondensate (A) comprising at least one polyurethane and/or polyurea block and at least one film-forming polymer (B); and (ii) the polymers (A) and (B) and the device being chosen so as to obtain, on leaving the device, droplets of composition with an average diameter of less than or equal to 80 μm .

2. Device according to Claim 1, characterized in that the average diameter of the droplets is less than or equal to 75 μm .

3. Device according to either of the preceding claims, characterized in that the composition contains an organic solvent.

4. Device according to any one of the preceding claims, characterized in that the polycondensate is formed by an arrangement of blocks, this arrangement being obtained in particular from:

- (1) at least one compound which contains two or more than two active hydrogen atoms per molecule;
- (2) at least one diol or a mixture of diols containing acid radicals or their salts;

(3) at least one di- or polyisocyanate.

5. Device according to Claim 4,
characterized in that the compounds (1) are chosen from
the group comprising diols, diamines, polyesterols and
5 polyetherols, or a mixture thereof.

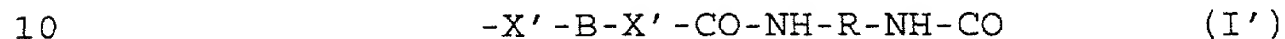
6. Device according to Claim 4,
characterized in that compound (2) is a 2,2-
hydroxymethylcarboxylic acid.

7. Device according to Claim 4,
10 characterized in that compound (3) is chosen from the
group comprising hexamethylene diisocyanate, isophorone
diisocyanate, toluylene diisocyanate, diphenylmethane
4,4'-diisocyanate, dicyclohexylmethane 4,4'-
diisocyanate, methylenebis(p-phenyl) diisocyanate,
15 methylenebis(4-cyclohexyl isocyanate), isophorone
diisocyanate, toluene diisocyanate, 1,5-naphthalene
diisocyanate, 4,4'-diphenylmethane diisocyanate,
2,2'-dimethyl-4,4'-diphenylmethane diisocyanate,
1,3-phenylene diisocyanate, 1,4-phenylene diisocyanate,
20 mixtures of 2,4- and 2,6-toluene diisocyanate,
2,2'-dichloro-4,4'-diisocyanatodiphenylmethane,
2,4-dibromo-1,5-diisocyanatonaphthalene, butane
1,4-diisocyanate, 1,6-hexane diisocyanate and
1,4-cyclohexane diisocyanate.

25 8. Device according to Claim 4,
characterized in that the polycondensate is formed from
at least one additional compound having a silicone
skeleton, chosen from the group comprising

polysiloxanes, polyalkylsiloxanes or polyarylsiloxanes, in particular polyethylsiloxanes, polymethylsiloxanes and polyphenylsiloxanes, optionally containing hydrocarbon-based chains grafted onto the silicon
 5 atoms.

9. Device according to any one of Claims 1 to 3, characterized in that the polyurethane and/or polyurea blocks of the polymer have a repeating base unit corresponding to the general formula I' below:



in which:

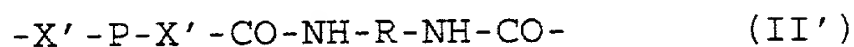
- X' represents O and/or NH,
- B is a hydrocarbon-based radical, this radical being substituted or unsubstituted, and
- 15 - R is a divalent radical chosen from alkylene radicals of aromatic type, C₁ to C₂₀ aliphatic radicals or C₁ to C₂₀ cycloaliphatic radicals, these radicals being substituted or unsubstituted.

10. Device according to Claim 9,
 20 characterized in that B is a divalent C₁ to C₃₀ hydrocarbon-based radical.

11. Device according to Claim 9 or 10, characterized in that the radical R is chosen from the group comprising hexamethylene, 4,4'-biphenylene-
 25 methane, 2,4- and/or 2,6-tolyene, 1,5-naphthylene, p-phenylene, methylene-4,4-bis-cyclohexyl radicals and the divalent radical derived from isophorone.

12. Device according to any one of Claims 1

to 3, characterized in that the polycondensate has a repeating base unit corresponding to formula (II'):



in which:

- 5 - P is a polysiloxane segment,
- X' represents O and/or NH, and
- R is a divalent radical chosen from alkylene radicals of aromatic type, C₁ to C₂₀ aliphatic radicals and C₁ to C₂₀ cycloaliphatic radicals,
- 10 these radicals being substituted or unsubstituted.

13. Device according to any one of the preceding claims, characterized in that the composition comprises, as a relative proportion by weight, between 0.1 and 30% of the polycondensate (A), preferably
 15 between 0.5 and 20% and even more advantageously between 1 and 10%.

14. Device according to any one of the preceding claims, characterized in that the composition comprises, as a relative proportion by weight, between
 20 0.1 and 30% of the film-forming polymer (B), preferably between 0.5 and 20% and even more advantageously between 1 and 10%.

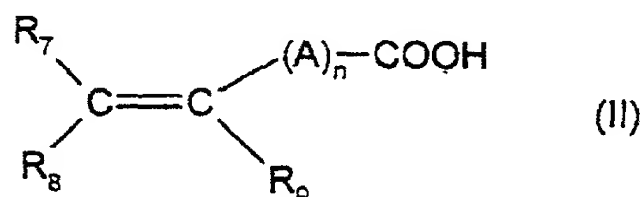
15. Device according to any one of the preceding claims, characterized in that the composition
 25 comprises an additional organic solvent present in a relative weight concentration of between 0.5 and 80%.

16. Device according to any one of the preceding claims, characterized in that the film-

forming polymer (B) is an anionic polymer chosen from:

- polymers comprising carboxylic units derived from unsaturated mono- or dicarboxylic acid monomers of formula:

5



in which n is an integer from 0 to 10, A denotes a methylene group, optionally connected to the carbon atom of the unsaturated group, or to the neighbouring methylene group when n is greater than 1, via a hetero atom such as oxygen or sulphur, R₇ denotes a hydrogen atom or a phenyl or benzyl group, R₈ denotes a hydrogen atom or a lower alkyl or carboxyl group, R₉ denotes a hydrogen atom, a lower alkyl group or a -CH₂-COOH, phenyl or benzyl group;

- polymers comprising units derived from sulphonic acid, such as vinylsulphonic, styrenesulphonic or acrylamidoalkylsulphonic units.

20 17. Device according to the preceding claim, characterized in that the anionic film-forming polymer is chosen from:

- acrylic acid copolymers, such as acrylic acid/ethyl acrylate/N-tert-butylacrylamide terpolymer;
- 25 - copolymers derived from crotonic acid, such as vinyl

acetate/vinyl tert-butylbenzoate/crotonic acid
 terpolymers and crotonic acid/vinyl acetate/vinyl
 neododecanoate terpolymers;

- polymers derived from maleic, fumaric or itaconic
 5 acids or anhydrides with vinyl esters, vinyl ethers,
 vinyl halides, phenylvinyl derivatives and acrylic acid
 and esters thereof, such as methyl vinyl
 ether/monoesterified maleic anhydride copolymers;
- copolymers of methacrylic acid and methyl
 10 methacrylate;
- the copolymer of methacrylic acid and ethyl acrylate;
- vinyl acetate/crotonic acid copolymer;
- vinyl acetate/crotonic acid/polyethylene glycol
 terpolymer.

15 18. Device according to any one of Claims 1
 to 15, characterized in that the film-forming polymer
 (B) is an amphoteric polymer chosen from polymers
 comprising units derived from:

- a) at least one monomer chosen from
 20 acrylamides and methacrylamides substituted on the
 nitrogen with an alkyl radical,
- b) at least one acidic comonomer containing
 one or more reactive carboxylic groups, and
- c) at least one basic comonomer such as
 25 esters containing primary, secondary, tertiary and
 quaternary amine substituents of acrylic and
 methacrylic acids and the product of quaternization of
 dimethylaminoethyl methacrylate with dimethyl or

diethyl sulphate.

19. Device according to any one of Claims 1 to 15, characterized in that the film-forming polymer (B) is a nonionic polymer chosen from:

- 5 - polyalkyloxazolines;
- vinyl acetate homopolymers;
- copolymers of vinyl acetate and acrylic ester;
- copolymers of vinyl acetate and ethylene;
- copolymers of vinyl acetate and maleic ester;
- 10 - copolymers of polyethylene and maleic anhydride;
- alkyl acrylate homopolymers and alkyl methacrylate homopolymers;
- acrylic ester copolymers such as, for example, copolymers of alkyl acrylates and alkyl methacrylates;
- 15 - copolymers of acrylonitrile and a nonionic monomer chosen, for example, from butadiene and alkyl (meth)acrylates; and
- copolymers of alkyl acrylate and urethane.

20. Device according to any one of Claims 1 to 15, characterized in that the film-forming polymer (B) is a cationic polymer chosen from:

- the copolymer of acrylamide and dimethylaminoethyl methacrylate quaternized with dimethyl sulphate,
- copolymers of acrylamide and methacryloyloxy-
- 25 ethyltrimethylammonium chloride,
- the copolymer of acrylamide and methacryloyloxyethyltrimethylammonium methosulphate,
- quaternized or non-quaternized

vinylpyrrolidone/dialkylaminoalkyl acrylate or methacrylate copolymers,

- dimethylaminoethyl methacrylate/vinyl caprolactam/vinylpyrrolidone terpolymers, and
- 5 - vinylpyrrolidone/quaternized dimethylamino-propylmethacrylamide copolymer.

21. Device according to any one of Claims 1 to 15, characterized in that the film-forming polymer (B) is a grafted silicone polymer comprising a
10 polysiloxane portion and a portion consisting of a non-silicone organic chain.

22. Device according to any one of Claims 1 to 15, characterized in that the film-forming polymer (B) is a functionalized or non-functionalized, silicone
15 or non-silicone polyurethane which is different from (A).

23. Device according to any one of the preceding claims, characterized in that it delivers an amount of composition of between 120 and 170 μ l when
20 the user presses once on the push-button, and preferably an amount of composition of between 140 and 160 μ l.

24. Device according to any one of the preceding claims, characterized in that the composition
25 also contains conventional cosmetic additives chosen from the group comprising fatty substances, thickeners, softeners, antifoaming agents, moisturizers, antiperspirants, basifying agents, dyes, pigments,

fragrances, preserving agents, surfactants, volatile or non-volatile silicones, in particular anionic silicones, polyols, proteins and vitamins.

25. Hair process for shaping or holding the hairstyle, characterized in that it comprises the use of a device in accordance with any one of the preceding claims.

26. Use of a device according to any one of Claims 1 to 24 for the manufacture of a hair styling product.

Declaration and Power of Attorney for Patent Application

Déclaration et Pouvoir pour Demand de Brevet

French Language Declaration

En tant que l'inventeur nommé ci-après, je déclare par le présent acte que:

Mon domicile, mon adresse postale et ma nationalité sont ceux figurant ci-dessous à côté de mon nom.

Je crois être le premier inventeur original et unique (si un seul nom est mentionné ci-dessous), ou l'un des premiers co-inventeurs originaux (si plusieurs noms sont mentionnés ci-dessous) de l'objet revendiqué, pour lequel une demande de brevet a été déposée concernant l'invention intitulée

et dont la description est fournie ci-joint à moins que la case suivante n'ait été cochée:

☒ a été déposée le _____
sous le numéro de demande des Etats-Unis ou le
numéro de demande international PCT
_____ et modifiée
_____ (les cas échéant).

Je déclare par le présent acte avoir passé en revue et compris le contenu de la description ci-dessus, revendications comprises, telles que modifiées par toute modification dont il aura été fait référence ci-dessus.

Je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

AEROSOL DEVICE CONTAINING A CONDENSATION
POLYMER COMPRISING AT LEAST A POLYURETHANE
AND/OR POLYUREA UNIT

the specification of which is attached hereto unless the following box is checked:

☒ was filed on October 25, 1999 as United States
Application Number or PCT International
Application Number PCT/FR99/02585 and was
amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

French Language Declaration

Je revendique par le présent acte avoir la priorité étrangère, en vertu du Titre 35, § 119(a)-(d) ou § 365(b) du Code des Etats-Unis, sur toute demande étrangère de brevet ou certificat d'inventeur ou, en vertu du Titre 35, § 365(a) du même Code, sur toute demande internationale PCT désignant au moins un pays autre que les Etats-Unis et figurant ci-dessous et, en cochant la case, j'ai aussi indiqué ci-dessous toute demande étrangère de brevet, tout certificat d'inventeur ou toute demande internationale PCT ayant une date de dépôt précédant celle de la demande à propos de laquelle une priorité est revendiquée.

Prior foreign application(s)
Demande(s) de brevet antérieure(s)

98/13807 France
(Number) (Country)
(Numéro) (Pays)

(Number) (Country)
(Numéro) (Pays)

Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 119(e) du Code des Etats-Unis, de toute demande de brevet provisoire effectuée aux Etats-Unis et figurant ci-dessous.

(Application No.) (Filing Date)
(N° de demande) (Date de dépôt)

(Application No.) (Filing Date)
(N° de demande) (Date de dépôt)

Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 120 du Code des Etats-Unis, de toute demande de brevet effectuée aux Etats-Unis, ou en vertu du Titre 35, § 365(c) du même Code, de toute demande internationale PCT désignant les Etats-Unis et figurant ci-dessous et, dans la mesure où l'objet de chacune des revendications de cette demande de brevet n'est pas divulgué dans la demande antérieure américaine ou internationale PCT, en vertu des dispositions du premier paragraphe du Titre 35, § 112 du Code des Etats-Unis, je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations, dont laquelle est devenue disponible entre la date de dépôt de la demande antérieure, et la date de dépôt de la demande nationale ou internationale PCT de la présente demande:

(Application No.) (Filing Date)
(N° de demande) (Date de dépôt)

(Application No.) (Filing Date)
(N° de demande) (Date de dépôt)

Je déclare par le présent acte que toute déclaration ci-incluse est, à ma connaissance, véridique et que toute déclaration formulée à partir de renseignements ou de suppositions est tenue pour véridique; et de plus, que toutes ces déclarations ont été formulées en sachant que toute fausse déclaration volontaire ou son équivalent est passible d'une amende ou d'une incarcération, ou des deux, en vertu de la Section 1001 du Titre 18 du Code des Etats-Unis, et que de telles déclarations volontairement fausses risquent de compromettre la validité de la demande de brevet ou du brevet délivré à partir de celle-ci.

I hereby claim foreign priority under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International Application which designated at least one country other than the United States, listed below, and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Priority Not Claimed
Droit de priorité non revendiqué

03 November 1998 ☐
(Day/Month/Year Filed)
(Jour/Mois/Année de dépôt)

(Day/Month/Year Filed) ☐
(Jour/Mois/Année de dépôt)

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International Application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International Application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose any or all information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

(Status) (patented, pending, abandoned)
(Status) (breveté, en cours d'examen, abandonné)

(Status) (patented, pending, abandoned)
(Status) (breveté, en cours d'examen, abandonné)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

French Language Declaration

POUVOIRS: En tant que l'inventeur cité, je désigne par la présente l'(les) avocat(s) et/ou agent(s) suivant(s) pour qu'ils poursuive(nt) la procédure de cette demande de brevet et traite(nt) toute affaire s'y rapportant avec L'Office des brevets et des marques: (*mentionner le nom et le numéro d'enregistrement*).

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this patent application and transact all business in the Patent and Trademark Office connected therewith: (*list name and registration number*):

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